
Space Weather Forecast

Issued on Monday, 12 August 2024 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: G1-G2/Minor to Moderate geomagnetic storms likely day 1 and day 2 with ongoing Coronal Mass Ejection (CME) arrivals. Further Moderate-class flares expected with a slight chance of isolated Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with three low level Moderate-class flares observed in the past 24 hours. There are nine sunspot regions visible on the disc. There are two large and complex spots on the disk, one in the southwest and one in the northeast, though the aforementioned flares only originated mostly from the spot in the southwest along with a smaller and simplifying spot near the southwest limb. All other spots are smaller and stable.

No Earth-directed coronal mass ejections were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind parameters were already showing a previous coronal mass ejection enhancement, and were indicative of at least one further coronal mass ejection arrival during the period. Solar wind speeds have risen from slightly elevated to elevated. The Interplanetary Magnetic Field was generally moderate to strong, peaking at 12/0100UTC. The north-south component was mostly positive until 11/2200UTC, thereafter it became largely negative, displaying periodic increasing negativity trends falling to strongly negative at times. Geomagnetic activity was at Active to G1/Minor Storm (Kp 4-5) levels on 11 Aug before becoming G2/Moderate to G3/Strong storms levels (Kp 6-7) on 12 Aug.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast, with occasional Moderate-class flares expected and a slight chance of isolated Strong-class flares.

Solar Wind /Geomagnetic Activity: Ongoing coronal mass ejection impacts are expected to wane day 1 before the arrival of up to two glancing coronal mass ejections later day 1 or on day 2, with speeds becoming elevated again. No further enhancements are currently expected days 3 and 4 with speeds gradually declining back to slightly elevated or background.

Geomagnetic activity is expected to fall from current G2/Moderate Storm (Kp 6) levels to Active or G1/Minor storm levels before the possible arrival of up to two glancing coronal mass ejections later day 1 or day 2, with further occasional G1-G2/Minor to Moderate Storming (Kp 5-6) intervals likely and a slight chance of a further G3/Strong Storm (Kp 7) interval. This risk decreases going into days 3 and 4 (14-15 Aug), with activity expected to decline towards Quiet to Unsettled levels (Kp 2-3).

Energetic Particles / Solar Radiation: A heightened risk of flare activity brings the slight chance of reaching or exceeding Minor Radiation Storm levels should any significant flares occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	70	70	20	20
Strong	G3	No	15	15	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	80	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)